

Discussion Draft – 11/28/07

Contents are initial ideas from a variety of sources and should not be considered formal positions of any individual or organization.
All errors are those of the facilitator.

**U.S. Environmental Protection Agency
Total Coliform Rule / Distribution System Advisory Committee**

INITIAL IDEAS FOR REVISIONS TO THE TOTAL COLIFORM RULE

PART I: RULE CONSTRUCT AND INDICATORS

Options to Consider and/or Concerns to Address	Implications for other parts of the rule	Related Comments
MCLG/MCL and related options regarding use of indicators <i>Current approach: MCLG of zero for TC and E. coli</i>		
Rework TCR as a treatment technique as opposed to MCL. Remove MCLG for TC and fecal coliform		
MCLG of zero for <i>E. coli</i>		
Use <i>E. coli</i> as sole indicator of fecal contamination		
Have an <i>E. coli</i> MCL (health based), rather than TC. Retain TC sampling where reasonable follow-up attention is required to determine whether there are any DS integrity issues associated with high TC occurrence.		
Remove “fecal” coliforms from rule structure		
Eliminate use of fecal coliform tests as they are difficult to interpret with regard to public health risks.		

Change the MCL for total coliforms (TC)/ <i>E. coli</i> (EC) to a treatment technique.	<p>Include use of total coliform monitoring at the entry point to distributions (could eliminate testing for surface water treatment plants that produce low turbidity and maintain CxT and disinfectant residual). However, only use EC testing in the distribution system.</p> <p>Include TC testing (along with EC) for systems that do not maintain a disinfectant residual.</p> <p>Non-compliance would include EC+ with no disinfectant residual or EC/TC+ for systems that do not disinfect. <i>[included below]</i></p>	The science does not support maintaining an MCL.
Retain current non-acute MCL threshold as threshold for changes to follow-up actions (e.g., level for treatment technique requirements)		
Keep total coliform as one indicator.		What does implementation tell us about TC as an indicator of system health and about appropriate actions? Should having a positive TC sample require direct investigation and corrective action?
Utilize Total Coliforms as assessment tool for system integrity		

There should be no MCL for TC monitoring.	Considerations could be given to consider as a treatment technique if coupled with other actions such as a sanitary survey.	
For total coliforms, a non-MCL approach (action-level or trigger, not treatment technique) when more than 5% (or another statistically risk-based defensible percentage) of samples during a month are TC positive.	The PWS should be required to take action, investigate, evaluate and correct their system. Eliminate requiring public notification that system is in violation of a non-acute MCL up to 30 days after the event.	Current public notification for non-acute MCL violations is 30 days after the event and is vague.
Triggers/action levels and resultant corrective actions – develop a progression of combinations of TC/EC positives to address characteristics of PWS response by system size / type	Develop follow up sampling requirements based on original TC/EC results and system size / type <i>[included below]</i>	
Use TC where it has been demonstrated to perform best: as an operational parameter that, along with other operational parameters, provides an indication of whether barriers against pathogenic microbes are working. Use TC as an operational parameter trigger that along with other parameters indicates when further attention is needed to retain confidence that microbial barriers are reducing risks. Eliminate TC in areas where it is poorly suited; that is as a direct indicator of public health Change the health parameter of the rule from TC to <i>E. coli</i> , a better parameter of public health protection	Develop guidance for actions to take in response to EC+ findings	

Change the non-acute MCL, but retain TC monitoring and associated response	<p>Tied to there being follow up action</p> <p>Change associated public notification</p> <p>Create a guidance document that identifies a tool box of responses to a TC+</p> <p>Retain state discretion</p> <p>If TC+ results in identification of a significant deficiency, retain flexibility to simply fix it. (Be careful about links to structured sanitary survey process to avoid unintended delays in corrective action.)</p>	<p>Don't leave a vacuum if the MCL is only <i>E. coli</i></p> <p>Also, consider state resources for tracking and documenting actions if TC is changed to an action level</p>
The TCR should be consistent with the GWR and require that total coliform positive samples be analyzed only for <i>E. coli</i> (not <i>E. coli</i> OR fecal coliforms)	Larger volume samples (200-300mL) may be warranted. If a new, better single organism or suite of new lab methods or indicators/pathogens is proven in the next few years, those may be the better alternatives, and the rule should leave room for them. <i>[included below]</i>	<i>E. coli</i> apparently is currently the better indicator of fecal contamination than the larger group of fecal (thermotolerant) coliform.
Consider additional indicators for which monitoring/testing should be required.		Are thermotolerant coliforms an indicator of pathogenic fecal contamination or of other microbials or pathogens of concern? Are they part of the big picture to meet all the objectives of this rule? What is the connection between <i>E. coli</i> levels and the presence of enteropathogens?
Consider disinfectant residual as alt indicator for some systems or as a way to qualify for reduced monitoring		An approach to addressing the unique characteristics of smaller systems

Monthly MCL <i>Current approach: 5% (2 samples for small) of TC + triggers a monthly MCL violation. Public notification associated with monthly and acute MCL violations.</i>		
Change the non-acute MCL, but retain TC monitoring and associated response <i>[repeated from above; implications for both sections]</i>	Tied to there being follow up action Change associated public notification Create a guidance document that identifies a tool box of responses to a TC+ Retain state discretion If TC+ results in identification of a significant deficiency, retain flexibility to simply fix it. (Be careful about links to structured sanitary survey process to avoid unintended delays in corrective action.)	Don't leave a vacuum if the MCL is only <i>E. coli</i> Also, consider state resources for tracking and documenting actions if TC is changed to an action level
5% (2 samples for small) of TC positive triggers investigative and possible corrective actions Change non-acute MCL to trigger level (resulting in Treatment Technique)	Systems would be triggered into the following TT requirements: <ul style="list-style-type: none"> - Notify the state when exceeding current TC threshold - Initiate investigation and potential corrective action based on outcome of investigation - Repeated exceedances of threshold would result in corrective action requirement <i>[see section below for more detail about corrective actions, combining ideas from a variety of members]</i>	

Acute MCL <i>Current approach: 1 E. coli positive and 2 TC positives triggers an acute MCL violation and public notification. Public notification associated with monthly and acute MCL violations.</i>		
MCLG of zero for E. coli with current rule provisions as the threshold for acute MCL violation	Add corrective action (TT) requirement for acute MCL violations	
MCLG of zero for E. coli and change threshold for acute MCL violation to one E. coli positive in routine samples	Add corrective action (TT) requirement for acute MCL violations	
Make it an acute MCL violation if a PWS elects not to take repeat samples following an E. coli positive or fecal coliform positive routine sample		Currently a monitoring violation
Non-compliance would include EC+ with no disinfectant residual or EC/TC+ for systems that do not disinfect.		
If a system takes more than one sample per month and repeat samples are negative, then a positive initial routine sample would not be a violation (for initial TC or EC positives).		
Treatment technique <i>Current approach: none</i>		
Lack of follow-up investigation or corrective actions would be a treatment technique violation		

Failure to take repeat samples after initial EC positive would be a treatment technique violation		
Use “action level” terminology, since not all systems treat (remedy isn’t always treatment)		

PART II. TCR MONITORING REQUIREMENTS

Options to Consider and/or Concerns to Address	Implications for other parts of the rule	Related Comments
Number of Routine Samples Required <i>Current approach: Number of routine samples is based on population served</i> <ul style="list-style-type: none"> - CWS – between 1-480 samples per month - Small CWS serving <1,000 – one sample per month <ul style="list-style-type: none"> o May reduce to quarterly if no TC+ history in current configuration; sanitary survey within last 5 years shows protected GW and no defects - NCWS serving <1,000 – one sample per quarter <ul style="list-style-type: none"> o May reduce to annually if sanitary survey shows system is free of defects - Collection of additional routine samples the following month for small systems <ul style="list-style-type: none"> o Systems collecting fewer than 5 samples per month must collect at least 5 routine samples the month following a TC+ 		
Only frequent, repetitive, microbial monitoring at appropriate DS points can assure that the other layers of protection are preventing unsafe water delivery and human illness. Reduced monitoring based upon variable or unrecognized characteristics of a system increases human health risk, and is inappropriate.	Disinfection residual maintenance and sanitary survey compliance are not enough to assure that distribution system intrusion and treatment deficiencies do not occur.	

Consider disinfectant residual as a way to qualify for reduced monitoring		An approach to addressing the unique characteristics of smaller systems
Increase minimum routine monitoring frequency to quarterly.		
Small and non-community groundwater systems that have not had coliform detections in the past 40 (or 80) samples should be eligible for reduced quarterly monitoring. Systems that maintain a disinfectant residual could also qualify for reduced monitoring.		Systems now have 20 years of TC/EC data.
Increase minimum routine monitoring frequency to monthly.		
Increase minimum routine monitoring frequency to one per month for all systems serving < 1,000. <ul style="list-style-type: none">• May reduce to one per quarter based on:<ul style="list-style-type: none">○ Source, treatment, violation history, sanitary survey history, water safety plan and annual State site visit○ May also reduce number of routines the month after a TC+ based on same criteria All systems serving > 1,000 may reduce monitoring based on same criteria Systems must take samples during times of normal operating conditions (exception, can take samples when a public health threat is suspected)		

<p>Increase minimum monitoring frequency to no fewer than two samples per month for undisinfected GW systems (one at entry to DS, one within DS). If no DS then minimum of one sample at point of entry.</p> <p>Additional routine indicators to supplement TC monitoring (e.g., distribution system disinfectant residuals monitoring)</p>		
<p>Explore ways of reducing routine reporting and changing to exception reporting.</p> <p>Initiate routine sample exception reporting (positives only) for systems serving more than 33,000.</p>	<p>This works on the basis of TC becoming an operational parameter and not an MCL.</p>	<p>Reduces burden on state resources.</p>
<p>Keep the requirement for additional routine samples the month following a total coliform positive for small systems.</p>		
<p>Sample Location Determination <i>Current approach: Samples collected at locations that are representative of water throughout the distribution system according to a sample siting plan. Sample siting plans subject to State review and revision.</i></p>		
<p>Retain written sample site plan requirement. Keep sample location up to state discretion</p>		
<p>Change concept of “representative sampling” to locations with potential higher risk. Reconsider locations of repeat monitoring to optimize value. Set criteria to be used to determine monitoring locations. State approval of monitoring locations.</p>		

Collecting sample for TC/EC at the entry point would be sufficient to measure treatment efficacy and provide a trigger for the Ground Water Rule.	We should define what constitutes a distribution system (no additional storage); fewer than x miles of pipe, etc.	
Repeat Sampling <i>Current approach: Collection of repeat samples based on routine monitoring results</i> <ul style="list-style-type: none"> - <i>If routine is TC+ the system must collect a set of repeats for each TC+ within 24 hours of result notification</i> <ul style="list-style-type: none"> o <i>3 repeats if system collects more than one sample/month</i> o <i>4 repeats if system collects one or fewer samples/month</i> - <i>System must collect repeats at site of original TC+, plus one within 5 service connections upstream and 5 service connections downstream</i> - <i>Additional repeats required until all repeats are TC- or system exceeds MCL and notifies the State</i> 		
Retain repeat sampling in some form		Important for determining needs for technical assistance. It is an invalidation tool
Eliminate the <i>requirement</i> for upstream and down stream sampling. Instead utilize repeat monitoring (the number of repeat samples can remain the same) to more effectively determine the extent or severity of system contamination.		
Develop follow up sampling requirements based on original TC/EC results and system size / type		
Modify the number of repeat samples for systems without a distribution system	Define a distribution system	
Modify repeat sampling requirement of 5 up 5 down for systems without a distribution system	Define a distribution system	

Keep repeat monitoring requirements as is.		
Monitoring violations <i>Current approach:</i> <ul style="list-style-type: none"> - <i>For routine monitoring:</i> <ul style="list-style-type: none"> o <i>Failure to report or take all of the required routine samples in a compliance period (major)</i> o <i>Failure to report or take some of the required routine samples in a compliance period (minor)</i> - <i>For repeat monitoring:</i> <ul style="list-style-type: none"> o <i>Failure to conduct all of the follow up repeat monitoring after a TC positive sample (major)</i> o <i>Failure to conduct some of the follow up repeat monitoring after a TC positive sample (minor)</i> 		
Perhaps we should make it an automatic (by default) acute MCL violation if a PWS elects <u>not</u> to make repeat samples following an <i>E. coli</i> positive or fecal coliform positive routine sample.		Currently only a monitoring violation.
Modify SDWIS so that data management needs are anticipated in advance		
Other monitoring suggestions <i>Current approach: No additional indicators currently used. The system must collect all repeat samples on the same day, except that the State may allow a system with a single service connection to collect the required set of repeat samples over a four-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 400 ml (300 ml for systems which collect more than one routine sample/month). The State has the discretion to allow a public water system, on a case-by- case basis, to forgo fecal coliform or E. coli testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or E. coli-positive.</i>		
Consider replacing (or augmenting) some of the small system TC samples with more easily performed tests such as chlorine residual.		

Provide options that include an integration of TC/EC monitoring and other measures of distribution system integrity – like measurement of a disinfectant residual.	Detection of <i>E. coli</i> with a loss of a disinfectant residual (for a system that normally maintains a residual) would provide a much earlier trigger for public notification than would collecting a second TC/EC sample. <i>[included below]</i>	
Include use of total coliform monitoring at the entry point to distributions (could eliminate testing for surface water treatment plants that produce low turbidity and maintain CxT and disinfectant residual). However, only use EC testing in the distribution system. Include TC testing (along with EC) for systems that do not maintain a disinfectant residual.		
Larger volume samples (200-300mL) may be warranted. If a new, better single organism or suite of new lab methods or indicators/pathogens is proven in the next few years, those may be the better alternatives, and the rule should leave room for them.		

PART III. FOLLOW UP ACTIONS TO A TC POSITIVE (OTHER?)

Options to Consider and/or Concerns to Address	Implications for other parts of the rule	Other
Specific follow up actions to a TC+ (or EC+) sample(s) <i>Current approach: none</i>		
The PWS should be required to take action, investigate, evaluate and correct their system.		
Develop guidance for actions to take in response to EC+ findings.		
<p>Create a guidance document that identifies a tool box of responses to a TC+. Retain state discretion.</p> <p>If a TC+ results in identification of a significant deficiency, retain flexibility to simply fix it. (Be careful about links to sanitary survey process to avoid unintended delays in corrective action.)</p>		Consider state resources for tracking and documenting actions if TC is changed to an action level.
<p>Systems would be triggered into the following TT requirements:</p> <ul style="list-style-type: none"> - Notify the State when exceeding current TC threshold - Initiate investigation and potential corrective action based on outcome of investigation - Repeated exceedances of threshold results in corrective action requirement 	Changing TC to a trigger or action level.	

<p>Investigative/corrective actions may include:</p> <p>Investigative:</p> <ul style="list-style-type: none"> - Conduct an operational evaluation with specified minimum criteria. - Provide a checklist of questions in guidance to assist in the investigation. - Investigation report would be provided to the States <p>Corrective Action toolbox to include:</p> <ul style="list-style-type: none"> - Cross-connection control program - Pressure maintenance - Flushing - Disinfectant residual in DS - Return to service protocols 	Changing TC to a trigger or action level.	
Add corrective action (TT) requirement for acute MCL violations.		

PART IV. ADDITIONAL SUGGESTIONS/PROGRAMMATIC ELEMENTS

Options to Consider and/or Concerns to Address	Implications for other parts of the rule	Related Comments
<p>Public Notification</p> <p><i>Current approach: Public notification associated with monthly and acute MCL violations.</i></p>		
Eliminate requiring public notification that system is in violation of a non-acute MCL up to 30 days after the event.		

Public Notification – eliminate the Tier 2 notification (30 days later). It is not effective risk communication. Either make notification Tier 1 for immediate health risks, or Tier 3 for procedural errors. Consider the effectiveness of Tier 1 notification – possibly requiring Reverse 911 calling for larger systems (>x-thousand population		
TC positive samples should be reportable to the primacy agencies so that technical assistance can be provided to the system as it attempts to locate the TC source		The TC public notification requirements are feared (at least by small systems).
Require public notification for TT violations and acute MCL violations (possibly separate monitoring from reporting violations)		
Keep public notification as is for acute MCL violations		
Detection of <i>E. coli</i> with a loss of a disinfectant residual (for a system that normally maintains a residual) would provide a much earlier trigger for public notification than would collecting a second TC/EC sample.		
The public notification requirements of TCR should be restructured to fit with revised rule structure		

Make public notification for non-community systems meaningful for the population that reads the notice. It needs to be informative, not punitive.		
More reasonable and accurate public notification requirements		Current public notice requirements are misleading and confusing to the public since a TC positive sample is only an indicator that the possibility exists for other organisms to exist in the water system that <i>may</i> or <i>may not</i> be harmful to the public.
Consider what rule implementation has told us about communicating with consumers.		What does risk communication thinking suggest we should do as part of reviewing the rule's objectives and provisions?
Make sure that public notification is appropriate to the health risk involved in an incident.	If the main health-based parameter is changed to <i>E. coli</i> then revise PN language accordingly for <i>E. coli</i> . Additionally develop appropriate public notification language for when systems apply reasonable follow-up attention when excessive TC is found.	
Sanitary Surveys <i>Current approach: Sanitary survey scope must address eight elements, including distribution systems and storage. No specified qualifications for sanitarians in federal rule. States identify significant deficiencies</i>		
Provide more specificity for qualifications for sanitarians.		

Use sanitary surveys more efficiently and effectively to meet the objectives of the rule.		
Consider eliminating separate sanitary survey requirements in the TCR, linking references as appropriate to the requirements of the SWTR and GWR.		
Consider consolidating all sanitary survey requirements in the TCR, having links in the SWTR and GWR to the TCR.		
<p>Role of Sanitary Surveys enhanced in revised TCR</p> <ul style="list-style-type: none">- Operators should incorporate the sanitary survey into their system's operating procedures.- Regular and routine follow-up on the findings of the sanitary survey.- Value of sanitary surveys is increased when coupled with enhanced operator training and reduced regulatory implications associated with a TC positive sample.		
<p>More specificity defined for the following elements:</p> <ul style="list-style-type: none">- Distribution systems<ul style="list-style-type: none">o Cross-connection control and backflow prevention program with defined minimum elementso Return to service criteria for main repairs, rehabilitation, new		

<ul style="list-style-type: none"> installations and replacement - Storage <ul style="list-style-type: none"> o Set specific criteria related to protecting water quality in storage tanks 		
<p>More specificity defined for additional distribution system related elements</p> <ul style="list-style-type: none"> - Pumps, pump facilities and controls - Monitoring, reporting and data verification - Operator compliance with State requirements 		
Retain state discretion to define significant deficiencies.		
Cross Connection Control Program <i>Current approach: No stand-alone requirements</i>		
Establish a federal regulation requiring water systems to have a distribution system cross-connection control program. This would not need to apply to the single building-served water systems at most transient, non-community systems.		The model standard of M14 by AWWA could be the reference guidance document or another equivalent guide issued by EPA.
Cross-connection control and backflow prevention program with defined minimum elements		
Create a broad, generic provision that encourages states to create a cross-connection control program	Consider linkages to GWR and sanitary surveys	Some states have strong cross connection control programs that are

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that works within different state systems (part 142 rather than part 141)		separate from sanitary surveys
Other Programmatic Elements <i>Current approach: No stand-alone requirements</i>		
Add return to service criteria for main repairs, rehabilitation, new installations and replacement		
Set specific criteria related to protecting water quality in storage tanks.		
Consider a pressure maintenance requirement		

PART V. OTHER SUGGESTIONS, COMMENTS AND CONCERNS

Options to Consider and/or Concerns to Address	Implications for other parts of the rule	Related Comments
Other suggestions, concepts or concerns <i>Current approach:</i>		
Change one of the three TCR objectives from “treatment efficacy” to “treatment efficacy and/or source water quality”		
Consider removing ground water systems without distribution systems from TCR if protected enough under ground water rule	Define a distribution system	

Consider application to wholesale systems		Currently have no requirements.
Address the unique characteristics of TNCWSs, NTNCWSs, and CWSs, both with and without distribution systems. Recognize that a simple rule is needed for small systems. Equivalent public health protection does not necessarily equal equivalent rule provisions for various sizes and types of systems.		
Explore different ways to categorize systems in order to better meet the rule objectives. For example, might surface water large and small, groundwater with disinfection and without, etc better meet the objectives of the rule for different kinds of systems than do the current “community system,” “non-community non-transient,” “non-community transient,” etc categories?		
Be open and creative in tailoring rule requirements to the various types and sizes of systems.		
Identify opportunities to simplify the TCR by clarifying the roles of GWR and TCR.		
Better utilize state resources by focusing state-system interactions on situations with public health significance and PWSs in need of assistance		
Less regulation can result in greater public health protection - Currently, operators are reluctant to use		

<p>additional TC testing as a tool to measure the integrity of the system because its sets them up for possible punitive action in the form of a public notice due to the fact of strict public notice requirements .</p> <ul style="list-style-type: none">- Allowing operators to use TC sampling without the threat of regulatory violations, gives the system operators an additional tool to measure the integrity of the system.- Enhanced operator training on all threats to the water system combined with the elimination of the current public notice requirements give operators the flexibility to thoroughly examine the system without the threat of regulatory violations.- With many of the unnecessary regulatory burdens removed, communication and relationships will improve between system operators and regulators regarding how to address issues that arise in a system. The current regulatory environment creates a situation where system operators may be reluctant to share facts about their systems.		
<p>TCRDS revisions should closely evaluate how any revisions will integrate with other rules.</p>		
<p>Cost implications of TCRDS: Consideration must be given to the fact that the same consumers that are being asked to improve drinking water conditions under the SDWA are also the same customers asked to</p>		

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make improvements under the CWA. In most communities, large and small, the decision to invest in such improvements will come down to what is necessary and best for the community, regardless of a regulatory requirement.		
Evaluate all options considered against the background of limited state resources Improving implementation equates to allowing state resources to focus on problem areas.		

NOTE: This draft discussion paper was prepared by the facilitators for review by the Total Coliform Rule Distribution System Advisory Committee. The Total Coliform Rule Distribution System Advisory Committee is a federal advisory committee chartered by Congress, operating under the Federal Advisory Committee Act (FACA; 5 U.S.C., App.2). The committee provides advice to the Administrator of the U.S. Environmental Protection Agency on revisions to the Total Coliform Rule (TCR), and on what information about distribution systems is needed to better understand the public health impact from the degradation of drinking water quality in distribution systems. The findings and recommendations of the Committee do not represent the views of the Agency, and this document does not represent information approved or disseminated by EPA.